



Right Abutment Seepage

Lowering Risk During Construction

In March of 2005, the Corps modified the lake operation with the aim of reducing high lake levels (typically experienced in the winter and spring months) to help take some stress off the foundation. This modified operation reflects a compromise between the need to lessen stress on the foundation and the needs of customers who benefit from the dam. Other measures, including further lake level reductions and enhanced emergency action plans, are being considered to reduce the risk while maintaining project functions. Impacts to those upstream who depend on the lake will be considered, as well as the risk and potential impacts to those downstream. Corps personnel are closely monitoring the dam every day of the week. We have identified numerous distress indicators that would prompt an immediate emergency drawdown of the lake; however, such an emergency condition is not anticipated.

The Corps is informing all Center Hill stakeholders and the public of rehabilitation plans and any modified lake operations by means of news announcements and public meetings that began in the fall of 2006. You may access the Corps website for project updates at:

<http://www.lrn.usace.army.mil/pao/issues/CENcommo>

You may use search programs and the key words:

Center Hill Seepage or **Nashville District Corps**.

What Can You Do?

If you live near the Cumberland River or one of its major tributaries, check to see if your property is within a designated dam failure flood area. The maps will be available this spring at your County Emergency Management office, the Corps offices, and at many public libraries as listed on our website. If you are in or near a designated flood area, you may:

- Purchase a weather band radio for early warning
- Have a plan for evacuation of your family to a designated gathering place
- Practice your evacuation plan
- Secure your property by locking doors and out buildings upon departure
- Establish a contact person or persons outside the flooded area for check-in
- Consider purchasing flood insurance (strictly a personal choice)

Phone: 615-736-7161

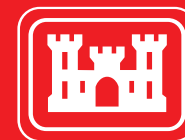
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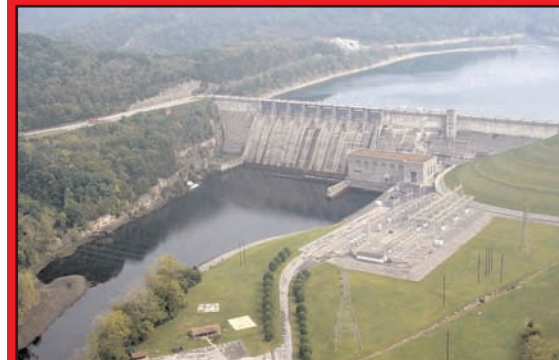
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Center Hill Dam

Center Hill Dam is located at Mile 26.6 on the Caney Fork River, a major tributary of the Cumberland River. The Center Hill project has been in service since 1951, providing important benefits of flood control, hydropower, recreation, water supply and water quality. Center Hill Lake is impounded by the dam and was designed to hold up to 2,092,000 acre-feet of water at its maximum flood control pool elevation of 685. (An acre-foot is a volume that is 1 acre large and 1 foot deep.) Center Hill Dam has a maximum height of 250 feet above foundation level. The main dam consists of a 1,382 foot long concrete section and a 778 foot long rolled earth embankment. A 125 foot high earthen saddle dam 770 feet long is placed in a low area in the right rim. A three-generator-unit power plant and switchyard are located immediately downstream. TN State Highway 96 runs across the top of the dam.



Center Hill Foundation and Rim Seepage

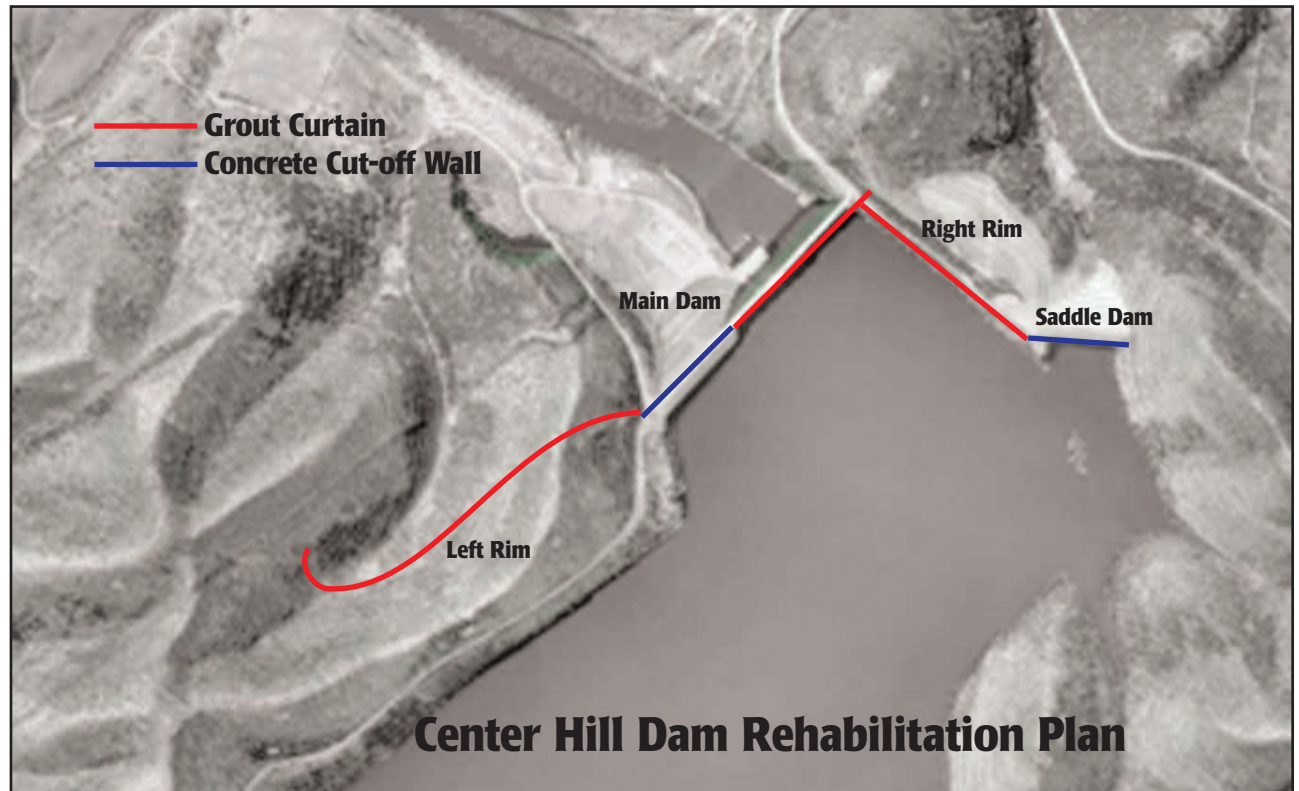
Seepage Problems

The dam was designed and built in the 1940's in a karst limestone foundation that is prone to seepage. Seepage is the movement of water through and under a dam. All dams have some seepage as the impounded water seeks paths of least resistance through the dam and its foundation. Seepage must, however, be controlled in both velocity and quantity to keep the dam safe. Original designers recognized the nature of the rock and the potential for seepage through the relatively thin rim sections and acknowledged that maintenance would be required to keep the dam safe. The Corps has closely monitored seepage since the 1960's and has completed several limited grouting programs in attempt to slow and control the seepage. Grout is a mixture of sand, cement and water that can be pumped under pressure into drilled holes in the foundation soil and rock to close any openings.

Foundation conditions continue to slowly worsen because clay-filled joints are eroding in the rock within the rims and dam foundation. If untreated, this erosion can eventually jeopardize the two earthen embankments (main dam and saddle dam) and the integrity of the rims. The Nashville District of the Corps of Engineers recently received Washington approval to begin a major rehabilitation project to ensure the long-term safety of the dam.

Fixing The Dam

The approved rehabilitation plan includes modern concrete cut-off walls constructed within the entire length of the main dam and saddle dam embankments. These walls will extend deep into the rock foundation to effectively cut off seepage through the embankments and



therefore protect the earthen portion of the dams from internal erosion. The approved plan also includes placing balanced stabilized grout (durable and long-lasting grout) beneath and along both sides of the entire dam.

Fish downstream from the dam depend on consistent cold water provided by seepage. The plan is to replace cold seepage downstream with a new small hydropower unit in the powerhouse. The existing 55 year-old unit was intended to provide back-up power to start the larger turbines. It will be replaced by a new 2 megawatt unit that will produce hydropower and provide the optimal minimum flow downstream.

The total estimated cost of the rehabilitation plan is \$220 million. The entire rehabilitation project will take 5-8 years to complete.

Plans to accelerate the work are being considered. Ongoing work includes design and site work. Drilling into the dam foundation for rock information began in November 2006. Initial grouting is to begin in the summer of 2007. This grout will make the dam safer by filling voids within the foundation. Cut-off wall construction will follow the grouting and is expected to begin in 2009.